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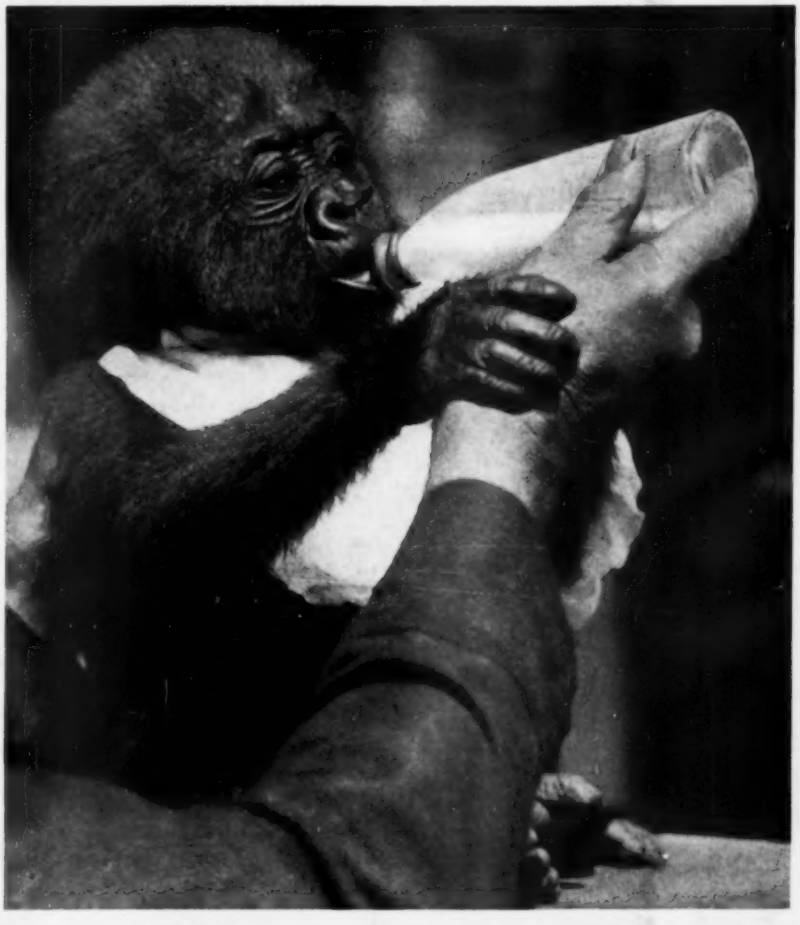
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



May 20, 1939

Cute Baby, But—

See Page 309

A SCIENCE SERVICE PUBLICATION

Do You Know?

An agricultural college says that only a few cats are good rat catchers.

The twisted tube of a French horn contains from 16 to 23 feet of brass tubing.

The caterpillar that turns into Abbott's sphynx moth is able to make a curious squeaking sound.

In 30 years, cases of blindness from babies' sore eyes have been reduced 75 per cent in the United States.

Recent figures list more than 12,000 women scientists in Soviet Russia, or 30 per cent of the country's scientific workers.

Apples and other fruits can be wrapped in thin latex as protection in shipping, by use of a new dipping process.

The ideal sound-proof room—which cannot be built—would be a box within a box, with absolutely no connection between the two.

Measured just after a two-hour nap some children were found to be as much as half an inch taller than at other times of day, after playing.

A new kind of paint can be applied to mattresses and pillows to close the pores and prevent dust particles from escaping; object: to aid hay feverites who are susceptible to proteins in pillow fillings.

The site of Solomon's palace in Jerusalem has never been found.

When glass breaks, the cracks move at a speed of nearly a mile a second.

Hens that are fed lobster shell will produce eggs with red-orange yolks.

Because it has high acid content, the tomato is one of the easiest foods to can.

Estimates regarding the native population of Africa range from 138 million to 163 million.

An insurance company finds that 50 percent of killings in 500 cases were due to temper aroused by trifling causes.

Almost all eyes that become blind by cataract alone can be helped, says an eye specialist; but, if the retina is damaged by disease, removing the opaque lens will not help.

Oysters are cultivated in Denmark's waters as a result of bottling up inlets sheltered from wind, introducing a layer of fresh water to help store heat, and adding a copper solution to induce oyster seed to "take root."

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

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MEDICINE

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When we convert our lunch into energy, what gland is in command? p. 309.

PHYSICS

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PHYSIOLOGY

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What makes psychiatrists think the brain has no special speech center? p. 310.

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STATISTICS

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SCIENCE NEWS LETTER

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ASTRONOMY

Two New Super Heavy Stars Are First Finds at McDonald

Great 82-Inch Telescope Discovers "White Dwarfs" So Dense a Handful of Their Substance Weighs Tons

TWO remarkable stars made of strange stuff a hundred thousand times heavier than water are the first major discoveries of the new McDonald Observatory 82-inch telescope. Even before this new giant instrument was formally handed over by its makers, Warner and Swasey Company, to the Universities of Texas and Chicago for their joint use, Prof. G. P. Kuiper was gathering with the great mirror upon extremely sensitive photographic film light from stars suspected of being relatively close to earth.

He was searching for heavy-weight "suns" that tax the human imagination, stars so dense that a handful of their substance weighs hundreds of tons, stars made of degenerate gaseous matter or atoms stripped to their hearts.

Two such mysterious "white dwarfs" new to astronomy were spotted by Prof. Kuiper. One of these is perhaps the most remarkable star ever discovered. It is the faintest such star ever found and it is so close to having no stellar atmosphere that there are absolutely no lines in its spectrum. This star, No. W489, is relatively cool and only such powerful telescope and fast photographic film as used would have detected it.

In six intensive weeks of observing with the 82-inch telescope, Prof. Kuiper captured 600 spectral photographs of 300 stars of large proper motions which showed them to be near us in the Milky Way. Discovery of two new white dwarfs among them is extremely good astronomical fishing.

Including the two new ones, only 18 white dwarfs are known to science. Prof. Kuiper has discovered half of these and he has reobserved all of them with the McDonald telescope since March 15.

Most famous of heavy-weight stars is the companion of Sirius, but the heaviest, discovered some years ago at Lick Observatory, is believed to have a density ten million times that of earthly water. This is less than half as dense as the absolute limit for solidness theoretically possible. When the atoms are knocked to pieces completely, without electrons and with only bare nuclei, this degenerate matter, still a gas, strange as it may seem, would be a hundred thousand times a hundred thousand times a hundred thousand times (ten to the fifteenth power) the density of water.

Besides his strange white dwarfs, Prof. Kuiper has discovered another family of faint or under-luminous stars. These are about a third of the size of our sun, instead of being about the earth's size like the true white dwarfs. The sub-dwarfs are made of ordinary star gas instead of the degenerate superheavy matter.

New Concept of Universe

A NEW kind of universe built out of mathematical logic instead of physical observation, yet capable of encompassing and explaining other suggested universe pictures painted by Newton, Einstein and other cosmologists, is offered to science by the British mathematical astronomer, Dr. E. A. Milne, of Oxford University, speaking on occasion of McDonald Observatory's dedication.

A sort of universe to end, or at least reconcile, all universes, the Milne cosmology has the appeal of being more philosophically and religiously satisfying. It does not call upon any irrational factors or mystical ideas to explain it.

Not only is the immense far-flung expanse of galaxies explained, but the Milne universe can be applied to the hearts of atoms, gravitation and electricity.

Although its need arises out of the American exploration of space with giant telescopes, resulting in the discovery of millions upon millions of giant galaxies of stars, Dr. Milne's universe-building discards as a basis the physical observations of the world about us. Instead of starting with what the telescopes show to be in the visible universe, Dr. Milne builds physics from the bottom up, renouncing outside facts, and starting only with the fundamental phenomenon of the passage of time.

By time-tried mathematical procedures, Dr. Milne derives from our individual awareness of the passage of time a system of agreeing time-keeping in different places in the universe. From these time relations come a kind of kinematics and dynamics that are used to give a logical meaning to what is called uniform time. This allows explanations of gravitation and electromagnetism as well as the observed facts about the physical universe.

In a sense, Dr. Milne has attempted to

ON A TEXAS MOUNTAIN TOP

World famous astronomers discussed the Milky Way galaxy in which we live and the known facts and theories about extragalactic space. These important meetings followed dedication of the new 82-inch reflector on Mt. Locke, in Texas' Davis Mountains.

do for physics and astronomy what the Greeks did when they took the isolated facts of Egyptian mathematics and combined them into a logical system. The bringing of the atomic world into the same set of rules that governs the rest of the universe is one of the unsolved problems of science. Einstein and others have also been attempting to bring gravitation and electrodynamics into one set of theories. If the Milne picture of cosmology succeeds in accomplishing these objectives, it will be a major achievement.

One major consequence of Dr. Milne's work is that the two conflicting conceptions of space and time, the Newtonian static universe and the expanding universe of Einstein's special relativity, can be reconciled and in fact shown to be variations of the real universe.

The universe based on Newtonian dynamics, which Dr. Milne calls "Tau time" because he uses that Greek letter to designate it in his equations, is stationary, homogeneous, infinite in extent and hyperbolic in space type. The expanding universe of special relativity in what is called T time has the nebulae or star systems rushing out with tremendous speeds, its matter is not evenly distributed, it has a finite limit to its maximum expansion. It is described as a "flat private space." Yet analysis by Dr. Milne shows that T time becomes Tau time when the universe is viewed from any particular location.

One consequence of the Milne formulations of space and time is that if a material solid rod of some sort could be made to join two great stellar galaxies rushing away from each other at tremendous speeds, it would not break because it would expand at the same rate as the expanding universe of which it would be a part.

Starlight Dimmed by Clouds

EVEN the brightest parts of the Milky Way stretching across the night sky would be twice as bright were it not for light-absorbing clouds of interstellar matter that dim their starlight, Dr. Joel Stebbins, director of Washburn Observatory, Madison, Wis., told the astronomers.

These dark clouds of cosmic dust that capture night light lie close to the main plane of the Milky Way. They are so thick that light coming to earth takes about 325 years to pass through them. However, the last 650 years of light's journey from stars to earth is through clear space. Dr. Stebbins plans to continue his researches to determine whether the sun happens to be in a clear region of space.

Until a few years ago astronomers did not suspect that stars are dimmed by clouds of interstellar material. By using the electric eye as well as the human eye and photographic plates, color differences were traced to irregularly distributed absorbing clouds in our part of the universe.

Galaxy Is Middle-Aged

WE LIVE on the outskirts of a middle-aged spiral universe of stars, which in the beginning was a great cloud of gas. As time goes on it will extend farther two spiral arms consisting of millions of stars, only to contract them again. This is the picture of our Milky Way presented by Dr. Bertil Lindblad, Stockholm Observatory, Sweden.

Look out at night upon the brightest part of the Milky Way in the region of Saggitarius and you are looking toward the center of our galaxy. It is thirty thousand light years away, obscured by clouds of cosmic stuff. In the central system of our own spiral nebula, there are a hundred thousand million stars, but our sun is not so centrally located as these. Instead, the sun with its family of planets is revolving about the central portion of the spiral, making the circuit in two hundred million years.

From the form of the Milky Way, Dr. Lindblad concludes that it is no longer young, but on the other hand is not unduly aged. It is probably at an age corresponding to "life begins at forty" in a human being.

Looked at from the outside it would remind one of a pinwheel with two streams of starfire, but revolving oppositely from a fireworks pinwheel.

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PSYCHOLOGY

Wager and Publicity Best Aids to Cutting Out Smoking

Best Way Is to Lose Desire, But That Is Not Likely; Lacking That, Make a Bet and Tell Everybody of It

IF YOU want to quit smoking, bet some friend a whopping big sum of money—a year's rent, say—that you are going to swear off smoking and then tell everyone you meet that you have sworn off. These two measures are recommended, as the surest and most practical way of breaking the tobacco habit, in a book by J. C. Furnas, *So You're Going to Stop Smoking* (Simon and Schuster).

The book also gives the low-down on why people smoke and what tobacco smoking does to the body.

A big bet and plenty of publicity enabled Mr. Furnas, himself a two-to-three-packs-a-day cigarette smoker, and his wife to stop smoking for six months, he reports. But his researches, which included sending questionnaires to many prominent persons after he discovered how interesting the subject was to himself and many others, produced many alternative methods which the smoker who wants to stop might try.

The best way, Mr. Furnas admits, is suddenly to lose the desire to smoke. George Ade did after an illness. John Spargo did without even an illness. Mr. Furnas dismisses this idea, however, as "involuntary magic" unlikely to come to those who are worried over how to stop smoking.

The next best way Mr. Furnas advises is to have some physician "scare the lights out of you about smoking." That this does not always work is shown by the testimony of Rose Wilder Lane, who stopped smoking for 10 days on a doctor's order, then lighted a cigarette and went to another doctor because she was "convinced the first one was stupid."

Rationing the number of smokes per day and tapering off are "poison," Mr. Furnas declares. One "automatic" smoker reported he was helped by what Mr. Furnas terms the "soul searching method" of asking himself each time he started to light up whether or not he really wanted to smoke at that moment. But Mr. Furnas clearly thinks little of this method.

The "Mammon Method" is the surest, Mr. Furnas believes, "for the crude, crass and thoroughly reprehensible reason that no sane person would light a smoke costing enough to pay the rent for a year."

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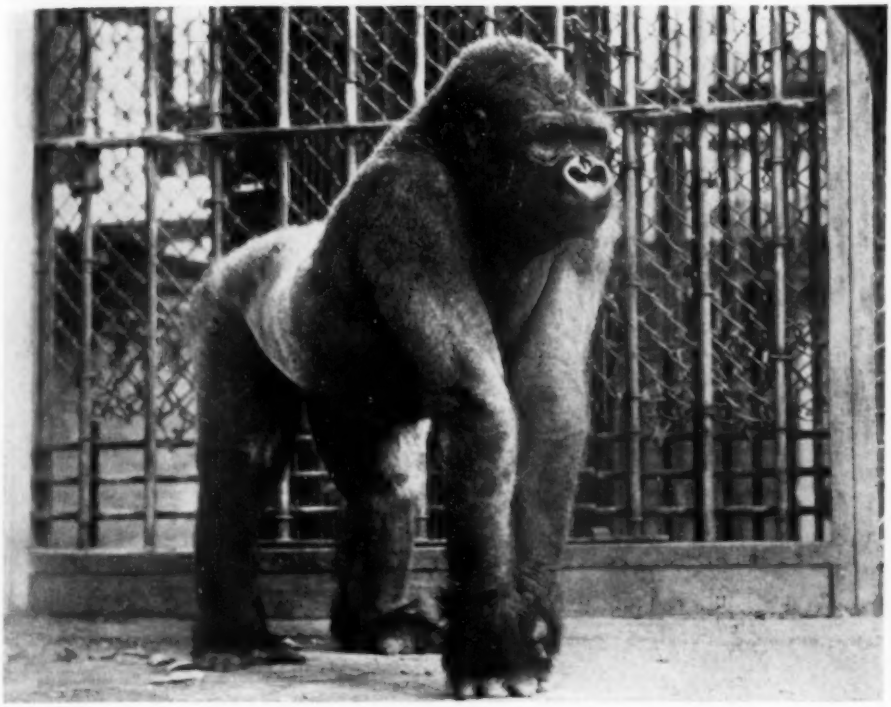

HE GREW UP!

The cover illustration of this week's* Science News Letter *is from a "baby picture" of Bamboo, the gorilla who is the pride of the Philadelphia Zoological Park. Bamboo was a gentle and appealing infant, but as he grew up into a big boy gorilla the nature normal to his species asserted itself and he could no longer be admitted to human society. (Cover photo by Newton H. Hartman.)

MEDICINE

Addison's Disease Patients Improve on Synthetic Hormone

Patients Taking Small Doses of Chemical Can Even Do Without High-Salt Diet; Gland Rules Use of Food

SMALL doses of a synthetic chemical have brought about general improvement and marked weight gains in seven patients suffering from severe Addison's disease, Drs. Kendall Emerson, Jr., George W. Thorn and H. Palmer Howard, of the Johns Hopkins University and Hospital, announced at the meeting of the Association for the Study of Internal Secretions in St. Louis.

In these cases, the chemical was given by injections under the skin, but the Hopkins doctors have previously reported good results when several months' supply of the chemical is made into a pellet like an aspirin tablet and buried in the fat around the shoulder blades. The operations in those cases, by Dr. Warfield M. Firor of the Hopkins surgical department, were performed under local anesthetic but with strict aseptic technic.

The chemical, desoxy-corticosterone acetate, is apparently the same material as the substance produced by the cortex of the adrenal glands. Without this vital gland product, life cannot go on. Addison's disease patients suffer from failure of the cortex of the adrenal glands, tiny organs near the kidneys, which makes them grow progressively weaker and more anemic and which turns their skins a grayish-brown color.

Extracts from the glands keep them alive, as insulin does diabetics, but the adrenal gland preparations are expensive, and in addition the patients must consume large quantities of salt because one feature of Addison's disease is dangerous loss of salt from the body.

The new chemical, prepared by a Swiss scientist, Dr. T. Reichstein of Zürich, can apparently take the place of the gland's own product. The patients at Johns Hopkins Hospital not only showed improvement in their general condition but careful tests showed normal conditions in their bodies. They could even get along with a low intake of salt. While the new chemical is now very costly and limited in quantity, there is hope that commercial production will bring the price down to the point where every Addison's disease sufferer can be given all he needs.

Feminized Roosters

SOME of the masculinized hens that have been reported from time to time were probably, on the contrary, feminized roosters. Sex hormone studies incating this were reported by Dr. L. V. Domm of the University of Chicago.

He injected estrin, the female sex hormone, into single comb brown Leghorn eggs during the second and fourth days of incubation and then let the eggs hatch and the chicks mature.

"The males of this experiment," Dr. Domm reported, "revealed an interesting sexual transformation. Some of the males appeared quite normal at this time while in others feminizing effects were evident in the plumage, but in none of our cases thus far observed has a complete henny plumage appeared during the first year.

"However, following the molt of the second summer many of them developed a henny plumage. A few again developed the plumage prevalent preceding the molt which was either cocky or intermediate. Head furnishings invariably became masculine in character though in some these have become more feminine with the change in plumage following the molt. Some of these birds are known to crow and tread. Others have not been known to display either type of behavior."

Post mortem examination of the sexually mature fowl revealed significant modifications of the sex organs toward the feminine type.

Gland Rules Food Use

THE conversion of sugars, starches and proteins such as meat into fuel for body activity and into new body tissues is under the control of the tiny gland in the head called the pituitary.

Discovery of how this "master" gland controls both protein and carbohydrate

metabolism was announced by Dr. C. N. H. Long, of Yale University School of Medicine.

The gland achieves its control over carbohydrates and proteins through three mechanisms as follows:

(1) Conversion of simple proteins into more complex ones in fed animals is speeded up or the breakdown of protein is slowed in fasted animals by one pituitary gland substance, probably the growth hormone.

(2) Another pituitary gland substance operates through the adrenal gland cortex to increase the breakdown of protein and consequently the formation of carbohydrates from protein or fat, in fasted animals. In fed animals this mechanism operates to diminish the proportion of carbohydrate oxidized.

(3) Utilization of carbohydrate in fed animals is checked by a pituitary gland factor which acts independently of any other gland factor.

Hormone for Old Men Rats

OLD gentlemen rats that had lost their youthful vigor were stimulated to renewed activity when given doses of a female sex hormone, emmenin, and a special extract of the adrenal gland, Dr. R. G. Hoskins and associates, Helen M. Levene and Sylvia Bevin, of Harvard Medical School, reported. Other gland preparations and various vitamin preparations did not succeed in making lively fellows of the old rats. Why the adrenal and female sex hormones were effective has not yet been explained.

Brain Waves Guide to Shock

BRAIN wave studies can furnish an exact guide to insulin shock treatment of the widespread mental sickness, schizophrenia, Dr. Harold E. Himwich, of Albany Medical College, Union University, reported.

During the treatment, he found, the changes in body chemistry, especially in the brain, and in the patient's symptoms fall into two phases which are paralleled by changes in the brain wave pattern. The best results of the treatment are associated with the second phase, when the patient becomes unconscious and when the alpha waves disappear from the brain wave records.

Brain wave records of the patients during treatment, it therefore appears, can be used to mark exactly the beginning of this therapeutically important part of the treatment.

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PSYCHIATRY

No "Speech Center" in Brain, Psychiatrist Declares

Psychiatrists Hear Also That Removal of Frontal Lobes Indicates They Govern Abstract Thought and Planning

NO SPECIAL physiologic and psychic mechanisms for speech exist, Dr. Leland B. Alford of St. Louis declared at the meeting of the American Psychiatric Association in Chicago. Speech is part of general brain activity rather than the exclusive function of a special group of cells, in Dr. Alford's opinion.

The idea of a special speech mechanism in the human brain arose, Dr. Alford indicated, from the fact that injury to a certain area in the brain results in aphasia, a condition in which the patient either cannot speak at all or can only speak haltingly and with great difficulty. Some patients, however, recover their ability to speak after such brain injury, Dr. Alford pointed out.

The loss of ability to speak in these cases is due, Dr. Alford believes, to the fact that following the brain injury the patient is in a markedly unstable mental state. His mentality is qualitatively complete, but he is subject to confusion, fatigue and emotional excitement. It is this unstable mental state that causes the aphasia, and not the destruction of any special speech mechanism, Dr. Alford believes.

Patients may be able to speak at the beginning of a psychological test, for example, but as they get tired or find the test more difficult or tedious, their unstable mental state leads them to take refuge in speechlessness, much as a neurotic patient might use speechlessness to escape a difficult situation.

The problem of locating brain activity in certain brain areas was attacked from another angle in studies of patients in whom the frontal brain lobes had been removed in operations for removal of brain tumors.

Lose Ability To Plan

GENERAL intelligence is not much affected by loss of the frontal lobes, but ability to handle problems and plan a line of attack is lost, Dr. Ira C. Nichols, of Providence, R. I. found from studying such cases. For example, one of these patients could not play even a fair game of checkers because he had lost the ability to formulate an attack. Hope for rehabilitation of such patients by re-education, however, appears from the fact that when the game of checkers was explained and the various moves shown, the patient learned quickly and six months later still made use of the information.

Further evidence that the frontal lobes of the brain are responsible for abstract thinking was reported by Dr. Ward C. Halstead of the University of Chicago. Patients without frontal lobes, he found, had difficulty grouping objects according to categories, that is by size, shape, color or some other common factor. This difficulty with abstract thinking following loss of the frontal lobes was apparent even in patients who had made good social adjustments following their operations.

The category test, Dr. Halstead pointed out, can also be used, other investigators have reported, in predicting the results of shock treatment for certain mental disorders.

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WEAPON AGAINST CRIME

PERFECT MATCH!

With the FBI's new comparison microscope shown on page 310, two threads can be brought together and blended optically until, if they match, they appear as a single strand. At the bottom is shown the relative size of the threads without magnification.

AERONAUTICS

N. A. C. A. Laboratories Are Devoted to High Speed Planes

New Wing and Other Projects Are Designed To Make The 500- or 600-Mile-an-Hour Plane a Reality

JUST in case you do not believe this is a speed-mad age, come down to a unique aeronautical laboratory in Langley Field, Va., where the world is in a 600-mile-an-hour whirl.

You may wonder at the wisdom of going so fast, but it's exciting and breath-taking anyway—even to the skeptic who doesn't want to go from New York to Los Angeles in four and a half hours. It's 19 wind tunnels, a dozen laboratories. It's 200 engineers and almost as many research projects driving ever harder at catching up with the speed of sound.

As transatlantic cables flash word of new speed records and of military planes in Europe so fast they can almost race a rifle bullet, Langley Memorial Aeronautical Laboratory, Uncle Sam's little known air research center, is turning more and more of its attention to extreme high speed flight. Its engineers are verbally tossing hundreds of miles an hour around as never before.

The wing for a 500-mile-an-hour airplane, which will probably make its debut within two years, has already been born there. Still more startling developments of a similar nature are on their way.

From the laboratory, operated by the National Advisory Committee for Aeronautics, have come in the past hundreds of developments that have boosted airplane speeds to their present level, and with them have come means for making airplanes safer and more reliable. But the public will be hearing less of the latter phases of the Committee's activities in the next few months as an air force expansion program preempts the attention of the scientists. They, more than anyone else in the United States, must see to it that this air force is based on knowledge that will make it better than any other in the world.

A few years ago the famous N.A.C.A. cowling, to fit around projecting cylinders of air-cooled radial engines, was perfectly satisfactory for all existing planes. But within the last year the trend toward higher speeds has forced the laboratory scientists to redo the earlier job and produce a cowling suited for the speediest Army pursuit ships fitted with radial power plants.

Exact studies of costly flush riveting have been worked out also, so that designers in the great aircraft plants may know how much additional speed can be gained. The speed-seeking N.A.C.A. scientists have even investigated the effect of seemingly slight surface irregularities on wings and found that smoothing them out adds to speed. The effects of different kinds of coating—bare, lacquered, painted—have also been studied with this same end in mind: hatching in five or six years' time the 600-mile-an-hour airplane. Because, even if a ten-mile-a-minute clip seems a little fast to you and me, it isn't to the men piloting America's national defense on the Front Aloft.

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PHYSICS

G-Men Fight Crime With Powerful New Microscope

NEWEST weapon of the G-men against crime is a specially built precision microscope so powerful it makes a split human hair look as large as a piece of government red tape.

With the new instrument, described by E. P. Coffey, chief of the FBI's Technical Laboratory, speaking before the New York Microscopical Society, a single hair from the clutched hand of a victim can be compared in magnified form with the hair from the head of the suspect. The two can be blended optically until, if they match, they will appear to the eye at the instrument as if they were a single hair. Color is revealed in tiny threads so small that they appear colorless to the unaided eye.

Human and animal hairs can be cut either lengthwise or crosswise and the sections studied for comparison of individual cells. The magnification of this instrument is much greater than that of the comparison microscope already in use for matching bullets. This new microscope magnifies 1125 times.

A new microchemistry laboratory at FBI headquarters, where instruments, beakers, scales, and so on are on a dollhouse scale, was also revealed by Mr. Coffey. In this laboratory a tiny fleck of blood from a stained bit of clothing can be analyzed to determine what animal it came from and, if human, even the blood group of the victim.

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A Stone Age woman whose skeleton was found in the Crimean Peninsula had the end joints of the little fingers cut off —a custom known in recent times among primitives.

MEDICINE

Caries More Prevalent Than Any Ill But Cold

DENTAL caries or decayed teeth are more prevalent than any other ailment except the common cold, the U. S. Public Health Service announced, following a survey of a typical town not far from Washington, D. C.

At the age of 15 years, 19 out of every 20 persons have or have had decayed teeth. The figure may be even higher among adults, but the survey was limited to school children.

There is as yet no scientific answer, the federal health service states, to the questions, Why do teeth decay? and, How can one prevent their decay?

"For the present at least," the Public Health Service advises, "the best that can be done is to feed the expectant mother, the infant and the child tooth-building foods and to visit the dentist early and often for the control of the extension of dental decay."

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CHEMISTRY

New Plastic Made From Coffee Will Aid Brazil

EVERY nation in the world, favored by nature to produce some major agriculture crop, now finds this factor a handicap as well as an asset. America's struggles with its surplus cotton are well known and Brazil has a comparable problem with its coffee.

For coffee, however, chemical research has developed a new plastic material which should not only do something about the coffee surplus but should spur, incidentally, other industries which employ plastics.

Invented and developed by the H. S. Polin Laboratory of Research in Physics, New York, the new coffee plastic is the kind that Brazil has long needed. The plastic can be made with Brazilian raw materials and with the importation of chemicals and reagents.

In many ways the coffee-plastic manufacture is a self-contained industry because the coffee not only provides its own chemical plasticizers and catalysts but also because the by-products of the process are sufficiently valuable to defray much of the cost of production.

Developed in both thermo-setting and thermo-plastic types, the new material from coffee is no hard-brown, coffee-looking material. It can be produced in green, red, mahogany, brown, yellow and ebony black hues merely by the chemical development of its own coloring materials, in which the green coffee bean is unusually rich.

Varying degrees of hardness and resiliency can be achieved and the material can be molded, drilled, machined, sawed and polished. It has good dielectric strength for insulator use and is resistant to weak acids, fruit juices, alkalis, oils and other chemicals. Moreover, it is odorless and tasteless.

Brazilians see the new coffee plastic as only the entering wedge for other industries. Its use in low-cost radio cabinets should stimulate the making of radios. The building trades should benefit by the production of flooring materials, wall board, roofing and other useful materials whose starting point is coffee plastic.

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AERONAUTICS

Lockheed to Build Four-Motored Airliner

THE Lockheed Aircraft Corporation, builders of fast transports and bombers and of the Army's new twin-engined pursuit plane, announces plans for construction of a four-motored airliner to carry 28 passengers. The prototype will fly in the spring of 1940 and deliveries will be made during the same year.

Entrance of the 27,500-pound 220-mile-an-hour luxury liner into the transport field in the United States indicates that American commercial operators will be flying four-motored equipment on their main routes within two years, as the Excalibur, as the plane will be called, is the third plane in its class. The Boeing Aircraft Company has a 33-passenger 45,000-pound ship, the 307, and the Douglas Aircraft Company plans to introduce the Goliath of them all, the 42-passenger 65,000-pound DC-4.

Four 600-horsepower Pratt and Whitney engines will be fitted to the ship, which will carry a crew of three in addition to its passenger load. A tricycle landing gear—now bidding fair to become universal transport equipment—will be built into the plane.

Though no comment was immediately available, it appears that the Excalibur has been designed to achieve the safety of four-motored airplanes and overcome a widespread criticism of the other two ships of the same class: that they were too big. Its wings will measure 95 feet across, and the fuselage will be slightly more than 74 feet long.

Science News Letter, May 20, 1939

IN SCIENCE

ANTHROPOLOGY

Dying Indian Tribe Claim They Were "Chosen People"

THE "chosen people" who should have ruled the earth are the Yaruro Indians, primitive Venezuelan tribe. So these Indians themselves have declared to Dr. Vincenzo Petrullo, former University of Pennsylvania anthropologist who visited them, and who has just reported on their strange beliefs in a U. S. Bureau of American Ethnology publication.

The white man's sheer wickedness is the only explanation Yaruros can offer to account for present economic domination of the world, Dr. Petrullo finds.

Yaruros believe in a great mother in heaven named Kuma, who created mankind, starting with the Yaruros. Kuma originally gave all domesticated plants and animals of the white man to the Yaruros, but the size of horses and cattle frightened them, so that they refused to tame either. The white man having seized the opportunity they threw away, the Yaruros philosophically have abandoned hope of bettering themselves, Dr. Petrullo explains. They fix their eyes on a heaven where they will recapture their ancient mode of life—and foreign people will be excluded.

Science News Letter, May 20, 1939

GEOLOGY

Australian Iron Meteorite Received At U. S. Museum

A TON of iron that fell out of the sky and plunged into the earth in Australia 36 years ago will be placed on display soon, at the U. S. National Museum. It is probably a part of the great Cranbourne meteorite, for it was found in the same general region where other pieces of that body fell.

The largest fragment of the Cranbourne meteorite, which burst high in air as it was falling, is now in the British Museum in London. It weighs more than three tons. The second largest fragment, weighing about half that much, is now in the Melbourne Museum in Australia.

Science News Letter, May 20, 1939

NE FIELDS

STATISTICS

Widows Marry Younger Men Than Do Spinsters Over 30

THE JUNE bride may not realize it, but the age of the man she marries is conditioned by her own age and previous marital status. The men who marry widows and divorcees, for example, are younger than those who marry spinsters.

The data on age at marriage and remarriage have been compiled by statisticians of the Metropolitan Life Insurance Company.

Widows or divorcees under the age of 30 tend to take slightly older husbands than do spinsters of the same age, the figures show. Above age 30, however, the situation is reversed, widows and divorcees who marry at this age tending to take somewhat younger husbands than do spinsters marrying above age 30.

This statement still holds, the life insurance company statisticians report, when special account is taken not only of the bride's but also of the bridegroom's previous marital status. The grooms who had been previously married are, however, about seven years older on the average than the corresponding bachelors.

Science News Letter, May 20, 1939

PSYCHIATRY

Mental Ills Not Inherited Like the Color of Eyes

YOU don't inherit mental disease as you do the color of your eyes or hair.

But for all that, mental ills do "run in families." The discovery of this seeming contradiction is reported by a trio of experts on the statistics of mental disease, Drs. Horatio M. Pollock, Benjamin Malzberg and Raymond G. Fuller, in a new book "Hereditary and Environmental Factors in the Causation of Manic-Depressive Psychoses and Dementia Praecox". (*State Hospitals Press*)

Studying all the available relatives of mental disease patients — sisters and brothers, uncles, aunts, parents and grandparents—these scientists found no evidence of any exact theory of inheritance that would fit the facts. Certainly it is no clear-cut case of Mendelian inheritance.

A mentally diseased father or mother cannot hand on this trait as eye color is handed on.

But, equally certainly, mental disease occurs among the relatives of mental patients more often than it occurs in the general population. Perhaps what is inherited is a predisposition toward mental breakdown — a sort of constitutional weakness that makes a person succumb to strains that another could withstand.

But in addition to this possible predisposition the parents of the mentally diseased also bequeathed them a particular sort of family circle in which to grow up. It is very difficult to sort out the effects of physical heredity and those of the home into which the individual is born.

Personality, which is intimately tied up with mental disease or health, is a product, probably, of both heredity and the psychic environment into which one is born.

The "shut-in" type of personality is, these scientists observed, "encouraged as a result of the extremely restricted social lives of the patients and their families. A high percentage of these families were described as having no social contacts with persons outside the restricted family limits. As they grew older, the patients demonstrated lack of a normal degree of aggressive and adventurous spirit by failure to strike out for themselves and to create new careers and new homes."

Science News Letter, May 20, 1939

PHYSIOLOGY

Running Fits of Dogs Due to Lack of Vitamin B_1

LACK of vitamin B_1, which results in polyneuritis and beriberi in human beings, has been identified as the cause of a mysterious and serious ailment of dogs, running fits, by Dr. John W. Patton of the Patton Biological Laboratories in East Lansing, Mich.

Dogs fed on a diet deficient in the vitamin, known chemically as thiamin, but adequate in all other respects, developed typical symptoms of running fits or fright disease—loss of appetite, nervousness, irritability, running, convulsive seizures and howling, Dr. Patton reports (*Veterinary Medicine,* June)

Doses of the vitamin in concentrated form promptly checked the symptoms and, following a return to an adequate diet, no further difficulty was experienced. The experiments were repeated several times, using altogether more than 60 dogs.

Science News Letter, May 20, 1939

AERONAUTICS

Sixty Enroll in First Airline Apprentice School

THE FIRST airline apprentice program for training aviation mechanics to be operated by a U. S. airline will be opened shortly at several of its maintenance bases by American Airlines.

Sixty young men, whose minimum age is the legal working age, and maximum is twenty-five years, have already been signed to a four-year course of study, for which they will be paid by the airline, it was said. Enrollment for the course is already filled and has been closed. It will not be opened for eight or ten months.

Headed by T. J. Healy, former maintenance supervisor for the line at Cleveland, the school is one of the steps now being taken by government, manufacturers and others to fill an anticipated shortage of properly trained aviation mechanics as America's air defense and air industry expand. Lack of sufficient numbers of sufficiently skilled workmen has been widely feared as the most serious bottleneck faced in the growing aviation field.

Science News Letter, May 20, 1939

PUBLIC HEALTH

Human and Cattle Ailments Fought in Panama

DOWN in Panama, now a world's crossroads for commerce and civilian travelers as well as for battleships, a vigorous campaign against human and animal plagues is being carried on by the staff of the Gorgas Memorial Laboratory.

Advances in the fight were reported by Dr. Herbert C. Clark, director of the laboratory, at the Gorgas Memorial Institute.

A slow but steady fall in malaria infection among the rural population, with cases almost at the vanishing point, has been accomplished by measures described by Dr. Clark. The "human seed bed" of malaria, however, has not been entirely eradicated, he said, indicating that the fight against this plague must go on.

Chagas' disease, relapsing fever and filariasis were unexpectedly discovered in Panama during the malaria surveys, Dr. Clark reported.

Moon blindness and the real "sleeping sickness," trypanosomiasis, of horses are also being fought by the Gorgas laboratory.

Science News Letter, May 20, 1939

PHYSICS

Rare, Liquid Helium Is Easily Made by New Discovery

RARE liquid helium—the coldest substance in the world—is now being prepared easily and cheaply in the Clarendon Laboratory, Oxford University, by a new method, it is announced in *Nature*. (May 6)

In the new process, developed by Drs. A. H. Cooke and R. A. Hull, liquid helium is pumped off through a tiny hole in a membrane and thus cooled by evaporation.

The new technique minimizes the strange behavior of liquid helium II known as "creep" and prevents it from occurring almost completely because the creeping helium has difficulty in getting through the tiny orifice. The scientists claim that any laboratory with inexpensive pumping equipment can now make the rare liquid helium whose production formerly has been limited only to laboratories possessing elaborate, costly pumping systems of large capacity.

To make liquid helium scientists compress helium gas to pressures of 400 pounds to the square inch. Then they cool it with liquid air and then with liquid hydrogen. By this process a temperature of 14 degrees absolute is reached.

To attain lower temperatures the liquid helium is then pumped off. By evaporation further cooling is attained. However, the large pumping openings prevent a lowering of the temperature much below 4 degrees absolute by this method.

It seems that the strange (and yet-unexplained) ability of helium II to creep rapidly over surfaces make most of the pumping effort useless for real cooling. The helium, it appears, creeps around the walls of the pumping outlet tube until it finds a warm spot. There it evaporates and the gas is what is really pumped off. Actually, to get cooling it is necessary to pump off helium gas from the cold spot of the chamber.

The new Cooke-Hull method places in the cold chamber a membrane in which a tiny hole (.15 millimeters) has been bored. This prevents creeping and keeps the helium in the really cold part of the chamber where further pumping will produce cooling. By this means temperatures only .73 degrees above absolute zero have now been attained with only small laboratory diffusion pumps of a capacity of 10 liters per second. The technique is a real advance in the low temperature art.

Science News Letter, May 20, 1939

METEOROLOGY

Long Wet Spell Has Been Boon to Forests of East

THIS spring's long wet spell in the eastern half of the United States, which has driven farmers to despair because it made their fields too wet to plow, has been hailed as a blessing by foresters because it made the woods too wet to burn.

Especially in New England has this been the case. Late snows, followed by persistent rains, have kept the vast tinderbox of down trees left by last fall's hurricane well blanketed against the fire that the whole region rightly dreads. Meanwhile thousands of axes and saws are working against time, to salvage the timber for use and remove as much as possible of the fire hazard.

Congress provided a $5,000,000 appropriation for the salvaging of the wind-felled trees. Already about $3,000,000 worth of logs and sawed lumber have been bought and are in storage, the logs in ponds and the lumber in guarded piles. The logs amount to some 255,000,000 board feet, the sawed lumber to 30,000,000 board feet. There are 200 sawmills under contract for the work, of which 125 are now operating.

In the woods 1,200 men, mostly former CCC enrollees, are doing the front-line work. They constitute 25 fifty-man camps, which are kept on a mobile basis.

It is only during the past few days that the woods have begun to show signs of drying out. The foresters and timber workers know that their rainy luck cannot last forever, and they are taking advantage of every possible working day. Even after the fire season starts, they will keep up the battle.

Elsewhere in the country, the forest fire situation is beginning to shape itself—in some regions quite critically. The Pacific Coast forests are already acutely menaced by fire, in a region where the "normal" fire season does not open until July. Long and severe drought on the Coast, especially toward the north, is responsible.

High danger of forest fire also exists in the Southwest, in Arizona, though New Mexico forests are not in a dangerous state at present. Other danger spots reported by the U. S. Forest Service are Alabama and the Southern Appalachians. Foresters in other parts of the Southeast, the East and the North Central areas report only "low to moderate" fire hazard.

Science News Letter, May 20, 1939

MEDICINE

Men And Technicians Needed in Army Medicine

THE U. S. Army Medical Department needs additional enlisted men even more than it needs new doctors, the *Army and Navy Journal* (May 6) states editorially. Everybody can see the need of doctors when men are getting wounded and sick in war time, but Buck Private, M. D., needed for thousands of routine jobs, has been neglected.

Even with recently authorized increases in enlisted strength in the Corps, the needs of peace time service will barely be met: "Less than 1,000 enlisted men are in purely military work, yet in time of war at least ten per cent. of the enlisted strength of the Army is required for the Medical Department."

Two other needs, now being met at least in part, are stated to be a reasonable number of registered pharmacists and of chemists, bacteriologists and other laboratory technicians.

Science News Letter, May 20, 1939

● Earth Trembles

Information collected by Science Service from seismological observatories and relayed to the U. S. Coast and Geodetic Survey resulted in the location of the following earthquakes:

Saturday, May 13, 9:01.6 p. m., EST

In vicinity of Honolulu, small local shock.

For stations cooperating with Science Service in reporting earthquakes recorded on their seismographs see SNL August 13, 1938.

PSYCHIATRY

Brain Waves Show Tendency To Epilepsy Is Inherited

Carbon Dioxide Plays Important Part in Problem— High Amount in Grand Mal Patients, Low in Petit Mal

BRAIN wave studies show that a tendency to epilepsy can be inherited from one's parents, even though the latter do not themselves have epilepsy.

This answer to the age-old question of whether it is safe for epileptics to marry and have children was given in an announcement by Drs. William G. Lennox and F. A. Gibbs and Mrs. E. L. Gibbs, of Boston City Hospital, at the meeting of the American Psychiatric Association in Chicago.

Solution of the problem of epilepsy is not impossible in an age of electricity, they said.

Brain wave patterns characteristic of epilepsy were found in over half of a group of parents of epileptics. Abnormal brain wave patterns were seen 10 times oftener among the parents of the epileptics than among members of a control group who were not closely related to an epileptic. In 92 per cent. of the families in which records were obtained of both parents, at least one of the parents had a definitely abnormal brain wave record.

"We believe that a disordered rhythm of brain waves is inheritable," the investigators stated, "and that the parent who shows this disorder, though free himself of the symptoms, is a carrier of the disorder.

"Hereditary traits seem discouragingly indelible," they added, "yet a hereditary problem which is electrical cannot be considered insoluble by our boasted age of electricity.

"The physico-chemical elements which combine to cause an electrical discharge are known and what is more important, certain alterations in these elements suppress the abnormal rhythms and the attending seizures."

Carbon dioxide, the gas that leaves your lungs with every breath you exhale, may be the key to the solution of the epilepsy problem. It seems to play the most important role in the electrical disturbances associated with epilepsy, the Boston investigators said. The concentration of carbon dioxide is abnormally high in patients subject to severe convulsions or fits, their chemical studies showed. It is abnormally low in patients suffering from transient loss of consciousness in the "petit mal" type of epilepsy.

The regulation of carbon dioxide in the blood in the arteries is regulated by the act of breathing, it was explained, but this does not explain the presence of carbon dioxide in blood leaving the brain nor the opposite measurements obtained in severe convulsions and petit mal seizures. It may take a long time to work out the relation between carbon dioxide and epilepsy and to apply it to solution of the problem but the investigators pointed out that "at least we seem to be on a path which leads somewhere."

Football For Epilepsy

LEARNING to play football and baseball as a means of overcoming epilepsy is a novel idea which may nevertheless be successful. Cases in which a rigorous program of physical education helped epileptics recover to the point where one lad became captain of high school football and baseball teams were reported by Drs. Temple Fay and Michael Scott, of Temple University, Philadelphia.

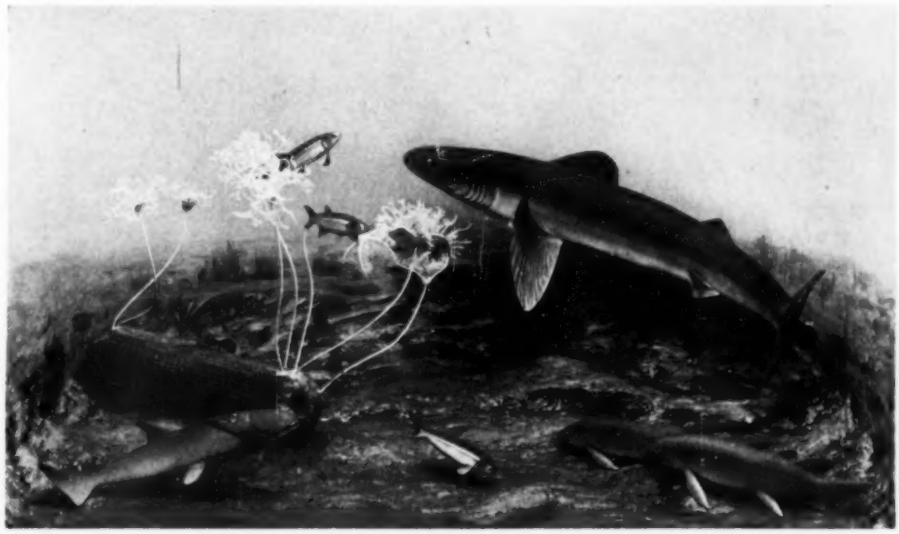
The idea back of this treatment was the psychiatrists' belief that an undersized heart was responsible for the epileptic seizures in nearly one-third of the patients they studied. The athletic program treatment was designed to develop "athlete's heart." The undersized heart, it was explained, might be temporarily unable to supply sufficient nourishment to the brain, causing temporary "starvation." The epileptic fits were believed to result from this condition.

New Drug For Epilepsy

MORE than 60 per cent. of a group of 250 epileptics have been completely free from seizures or fits during the two years they have been treated with a new drug, known as dilantin, Drs. H. Houston Merritt and Tracy J. Putnam, of Boston City Hospital, reported. Another 13 per cent. were greatly relieved.

These patients had been having the severe convulsions of grand mal epilepsy. Patients suffering from petit mal epilepsy were completely relieved of attacks in 38 per cent. of the cases and another 20 per cent. of these were greatly improved.

The usefulness of the new drug, dis-



"AS IT WAS IN THE BEGINNING"

Primitive fishes of the Devonian sea that once covered what is now western New York, as restored at the Buffalo Museum of Science. A big-finned shark has his eye on a group of small relatives of the modern gar, which are dodging among the tentacles of a group of crinoids, to avoid him. On the bottom, an armored pre-fish form and two lungfish.

covered in the course of a systematic trial of over 100 chemicals, was first announced by the Boston doctors last year. Its chemical name is sodium diphenyl hydantoinate. The drug is relatively non-toxic, few patients showing any inability to take it. It has the advantage over other drugs used in epilepsy of not being a sedative, so that patients taking it are not prone to sleepiness.

Hormones Change Moods

A NEW field for success in the treatment of mental disorders and glandular irregularities has been opened by a discovery announced by Drs. Theresa Benedick of Chicago and Boris Rubenstein of Cleveland at the meeting in Chicago of the American Psychoanalytic Association. The production of powerful hormones by the body's glands can be traced by psychoanalysis, these doctors find.

Their studies were limited to female sex hormone production. By psychoanalysis Dr. Benedick was able to tell from the changes in feeling and mood of the women studied just when production of one female hormone stopped and production of the other female hormone started. Her findings tallied exactly on the calendar with findings from physiological tests made by Dr. Rubenstein.

At the time when these tests showed that the sex-stimulating hormone, estrin, was being produced, psychoanalysis showed the women were interested in the opposite sex and in their conflicts over men. As production of this hormone ceased the women's feelings and moods changed. With beginning of the production of progestin, the pregnancy hormone, the women's interests and feelings, as revealed by psychoanalysis, were centered on themselves.

Glands, through their hormones, influence feelings and behavior, scientists have long known. More exact and specific knowledge of this important subject should be possible through further studies like those reported, which combine scientific measurements of feelings with measurements of chemical activity within the glands. Such studies might show doctors when to treat mental and behavior disorders with gland products, when to treat glandular irregularities with psychiatric measures, and when to combine both methods of treatment.

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Madness Pushes Into War

"WARS and threats of wars" show how greatly mental hygiene is needed today in the management of public affairs and for the guidance of those charged with responsibility for the conduct of nations, Dr. Richard H. Hutchings, of Utica, N. Y., declared in his presidential address before the American Psychiatric Association meeting in Chicago.

"The evils which afflict the deviated personalities set in high places soon are found to have permeated the body politic," Dr. Hutchings asserted, "and make evident the thin veneer which separates modern man from the tom-tom beating savage of an earlier day."

Referring apparently to Hitler, although he did not mention any name, Dr. Hutchings said, "the schizoid mystic who retires to the mountain top to commune with the elemental forces within his own personality returns upon occasion with renewed cathexes of anal-sadistic impulse, to bring about reactions which afflict whole nationalities and alter the form and direction of cultural progress."

Americans, Dr. Hutchings indicated, also need to practice mental hygiene.

"We cannot," he said, "with good grace point an accusing finger at our neighbors across the seas until something more is done about the obvious deficiencies in crime prevention and law enforcement in our own large cities. The contribution which psychiatry could make to the prevention of delinquency and crime has not been sufficiently tested."

The example of the few psychiatric clinics we have in connection with criminal and children's courts and courts of domestic relations has not received the public support and financial backing such undertakings deserve, he declared.

Hospitals for mental sickness are suffering from "overpopularity", Dr. Hutchings observed, pointing out that they are becoming increasingly homes for the aged. Since this trend will continue with the increase in the number of aged in the population and the increase in cures of mental illness in younger persons, Dr. Hutchings suggested the problem might be solved by putting "harmless ambulant seniles" in boarding homes. This would effect a great saving in the cost of care for these mentally afflicted old people and the success of such care, Dr. Hutchings pointed out, has been shown by the use of this method in Belgium.

●RADIO

Dr. A. Allan Bates, manager of the chemical and metallurgical department of the Westinghouse Electric and Manufacturing Company, will be the guest scientist on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Monday, May 29, 5:45 EDST, 4:45 EST, 3:45 CST, 2:45 MST, 1:45 PST. Listen in on your local station. Listen in each Monday.

Interview Better Than Jail

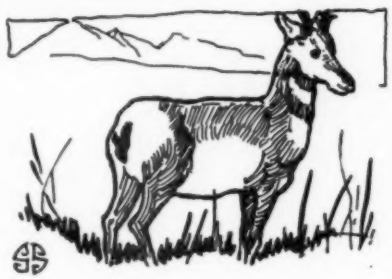
AN INTERVIEW with a psychiatrist is more effective and more economical than the usual short term jail sentence for misdemeanors such as traffic violations, wife-beating and drunkenness, Dr. Lowell S. Selling, psychiatrist to the Recorder's Court of Detroit, declared.

In fact, short term sentences are ineffective for drunkards, wife-beaters and other misdemeanors of the type who regularly appear before the courts, Dr. Selling said. The offender usually lapses back into his old habits immediately upon release.

"The experience of going to court, possibly with accompanying newspaper publicity and being required to make restitution for damage that they have done often causes a desirable change in attitude toward their traffic behavior," Dr. Selling said of another group of offenders. "The same change in attitude has been produced just as well by a lengthy interview in the clinic. The patient has to miss a day or two from work, his mechanisms are gone into thoroughly and he becomes aware of the significance of his offense so that we have concluded from the small number of repeaters who have returned that even if they were sent only for diagnosis, the examination is therapeutically effective."

CONSERVATION

NATURE RAMBLINGS
by Frank Thone



Ready to Return

FREQUENTLY we are moved to indignant pity by the story of a drunkard's dog, that always creeps back to lick his worthless master's hands, no matter how he may have been beaten and kicked.

Yet we have treated our wildlife worse than drunkard ever treated his dog. We have shot and trapped it, chopped and burned down its forest homes, plowed up its prairies, poisoned its rivers with sewage and industrial pollution. Naturally, it has vanished from large areas; our methods were massacre, no less; what could you expect?

But give those devastated areas just a little chance, let brush grow up where the forest was felled, clean the filth out of a river, establish a refuge only a few years—and the place fills up with game. You may have to plant a few birds or mammals (which will then multiply amazingly) but often you do not even need to do that. Wildlife will return unbidden.

During the past few years we have begun to awaken from our generations-long debauch of drunken waste of native resources. Naturally, we have something of a national headache, and equally naturally, we feel a bit of national remorse.

And behold. Already the scared wild things, that we abused almost to the point of extermination, are returning. Deer have become so abundant in parts of Pennsylvania, Michigan, and other one-time big-timber states that they are a problem to wildlife management, and the question of permitting the shooting of does is being seriously discussed.

Of lesser magnitude, but even more remarkable nevertheless, is the phenomenon of the comeback of the pronghorn antelope in the Far West. Once they were more abundant than the bison. Then they were over-hunted until they were in even greater danger than the bison of disappearing altogether. Protection came in the nick of time.

And last autumn it became possible for the State of Oregon to proclaim a short open season. There were many restrictions, of course; yet the unbelievable had happened: Men could hunt the antelope, whose grandfathers had hunted it, but whose fathers could not.

Science News Letter, May 20, 1939

BOOKS

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ANTHROPOLOGY

Face Painting Is Art To Seri Indian Girls

FEMININE make-up is sometimes jokingly dubbed creative art. But to see what our face painting might be, if really done in the creative spirit, visit the Seri Indians of west coast Mexico.

When a Seri girl attempts what she calls Pretty Face, she paints on nose and cheeks designs in color out of her own imagination. She may get ideas from flowers and seed pods, baskets, birds and snakes, the sun and moon. For a mirror she has a shell filled with water. For colors she chooses blue, yellow, red, black and white. She may paint with natural realism or with conventionalized technique.

Investigating this old American art is an achievement of two students of Indian culture, Dane Coolidge and Mary Roberts Coolidge, who spent six lively weeks near the wild Seris and put the experience into a new book, "The Last of the Seris" (Dutton).

Face painting is a Seri girl's only aesthetic expression, the Coolidges say. The tribe is poor and ragged, dwindling toward extinction, eking out a living by fishing, but still appreciative of prettiness. Girls design Pretty Face to attract sweethearts. But they also put face paint to other uses. They painted the faces of their men before war, as protection against pain and cold. They make up certain men of the tribe with special face paintings on festival days.

When the Coolidges supplied paper for drawing, Seri girls eagerly seized the chance to try their art with this new medium. The results showed great ingenuity, but when it came to explaining the pictures, shyness overcame the girls. A medicine man—father of seven daughters—explained the meaning of each line and mark.

The Seris, who are vanishing, have a striking literature of songs and traditions. They tell strange tales of white men with blue eyes and yellow hair, who came to them long ago. The Came-from-Afar Men were whalers. The Coolidges believe they may have been Norsemen.

Science News Letter, May 20, 1939

ENGINEERING

Pittsburgh Assured Against Recurrence of 1936 Flood

PITTSBURGH'S flood disaster of 1936—who remembers it? Few, probably, outside the Pittsburgh district itself. We are so engrossed in our own concerns that we are easily prone to forget our neighbors' troubles.

Yet Pittsburgh's troubles are reflected in the lives of all of us. So essential are the steel, glass and other industrial products of that smoky cornucopia that disaster to Pittsburgh is damage to the whole nation.

It is a matter for congratulation therefore that effective measures have been taken to prevent any recurrence of the

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great deluge of 1936. Ten great dams on the Allegheny and Monongahela rivers and their tributaries will hold back the freshets of late winter and early spring, not only protecting the city but regulating the flow for navigation on the Ohio and also materially abating stream pollution.

In *The Military Engineer,* (May-June) Lt.-Col. W. E. R. Covell of the U. S. Army Corps of Engineers tells of the work to date. Because the Pittsburgh watershed crosses state lines into New York, West Virginia and Maryland, the whole project has been taken out of state hands and made a Federal undertaking. The dams will stretch in a long line, in mountain valleys to the north and east, like fortifications against a raiding enemy.

One dam has been completed for more than a year, four more are nearing completion, three are ready to be undertaken as soon as funds are made available, and two await legislative clarification of status before work can be started.

Blessings already flow from the one fully completed dam. Not only has it checked at least one stiff freshet, but it has released the impounded waters later in the season to maintain navigation levels during a drought period, has made it possible for sportsmen to catch big bass in waters long sterile through pollution, and has diminished the pollution problems of city water supplies along the upper Monongahela by fifty per cent.

Science News Letter, May 20, 1939

ASTRONOMY

Hassel Comet Takes New Names As Prior Discoverers Are Found

LIKE some of the world's famous divorcées, who pick up new names with each change of partners, the comet Hassel is adding names with each mail delivery.

Full name of the comet is now Jurlof-Achmarof-Smith-Hassel, but to avoid this hyphenated terminology astronomers are going back to their standardized forms and calling the comet 1939 d.

First knowledge of the new comet, visible to the unaided eye low in the northwestern sky in early evening, came from Oslo, Norway, with the reported discovery by observer Hassel on April 16, 1939. Prof. S. Rosseland of the Oslo Observatory cabled the news to Harvard Observatory, which distributed the news quickly through the United States.

Thus, and quite rightly, American astronomers took to referring to the comet as the Hassel comet.

However, it now appears that other observers saw the comet too and did it before Hassel found it in his Norwegian observatory.

Two Russian amateurs, Jurlof and Achmarof, saw the comet on April 15, one day earlier than Hassel. They wrote of their discovery on April 16 and mailed the letter to European centers for distributing astronomical information. This slow method gave Hassel the apparent priority for a time.

Still more recently it has become apparent that a Canadian amateur astronomer, Lewis V. Smith, of Sedgewick, Alberta, saw the comet on April 15 also. Like the Russians, he announced his discovery by mail. This fact has only recently been received at Harvard Observatory. Thus the simple name, Hassel comet, now turns out to be Jurlof-Achmarof-Smith-Hassel. Latest reports on the JASH comet show it is rapidly leaving the earth and has dimmed from third magnitude brilliance to the fourth magnitude.

Science News Letter, May 20, 1939

PHYSIOLOGY

Vitamin Alphabet Going Out of Style

THE vitamin alphabet, that is, designation of the various vitamins by letter, is going out of style. For example, if you want to be really up-to-date, you must learn to say ascorbic acid instead of vitamin C when you are referring to the substance in orange juice, (or other citrus fruits, tomatoes and other vegetables) which prevents and cures scurvy.

This may be discouraging, especially if you pride yourself on having really learned the vitamin alphabet, or most of it. But the scientists who have most to say about vitamins, the nutritionists and biochemists, are trying their best to get the vitamins out of the alphabet. They make the point that the letters did very well for names in the early days of vitamin discoveries when only a few were known and not much was known about them. Now, however, since there are about as many vitamins as letters of the alphabet, with half-a-dozen going under the name of B, it is confusing and even leads to inaccuracy to call these essential food factors by letter.

Some of the vitamins have been identified chemically and even made synthetically. They have regular names, just as other chemicals have. Vitamin C is ascorbic acid. Thiamin is the beriberi preventing and curing substance that once went under the name of vitamin B or B_1. Nicotinic acid, the stuff that is curing pellagra, is the chemical that was variously called vitamin B_2, vitamin G and the P-P or pellagra preventing factor. Riboflavin is another diet essential that was once labelled vitamin B or vitamin G. Recent discoveries have shown that it is necessary for the health of both man and other animals.

The anti-sterility vitamin, formerly called E, is now known as alpha tocopherol. Vitamins A and D may keep their letter names for some time, because there is not so much confusion about them as about the B vitamins. Until the chemical composition of other vitamins is discovered, however, scientists favor calling them by descriptive names, not by letters.

Science News Letter, May 20, 1939

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Additional Reviews On Page 320

General Science

SCIENCE IN PROGRESS—George A. Baitsell, ed.—*Yale,* 322 p., $4. Here are presented and placed in perspective a score of new things that concern science most—atoms, isotopes, viruses, vitamins, hormones, chromosomes, human brain electricity, animal metabolism from mouse to elephant—written by such authorities as Lawrence, Urey, Stanley, Kunkel, Mason, Williams, Allen, Painter, Harvey and Benedict. The chapters bring into print the important Sigma Xi lectures of the past two years but they are revised and expanded to catch up with science's swift progress.

Science News Letter, May 20, 1939

History

THE ROAD TO RICHMOND. The Civil War memoirs of Major Abner R. Small of the Sixteenth Maine Volunteers, together with the Diary which he kept when he was a prisoner of war.—Harold Adams Small, ed.—*Univ. of California Press,* 314 p., $3.50.

Science News Letter, May 20, 1939

Economics

AMERICA REBORN: A Plan for Decentralization of Industry—Ralph L. Woods—*Longmans, Green,* 376 p., $3. Another chapter in the regional planning expert's denunciation of the lopsided development of the American population and urban growth, based on such facts as that 74 per cent. of the total wage bill is paid to 48 per cent. of the people, who live in 14 per cent. of the nation's land area. Tracing the causes of this situation, Mr. Woods outlines reforms which would bring about decentralization of industry.

Science News Letter, May 20, 1939

Radio

RADIO TROUBLE-SHOOTER'S HANDBOOK—Alfred A. Ghirardi—*Radio & Technical Pub. Co.,* 518 p., $3. A handy guide for the man who must service commercial broadcast or short wave band radio receivers, whether for a living or just because he fixes 'em when they go wrong. Trouble-shooting charts, case histories of radios, indices to model numbers, conversion tables and a wealth of other aids are included. Covers portable sound recorders, intercommunicator systems. A very usable volume.

Science News Letter, May 20, 1939

Aeronautics

HEAD WIND: The Story of Robert Loraine—Winifred Loraine—*Morrow,* 390 p., $3.50. A biography of an Englishman who will be remembered not only as an actor most closely identified with the part of Cyrano de Bergerac, but also as a pioneer aviator, one of the band of men who learned how to fly the queer contraptions the Wrights, Curtiss, Farman, Bleriot and others were building in the decade after 1903. He made the first flight across the Irish Sea and the first plane-to-ground wireless broadcast. He also set several distance records in aviation's younger days.

Science News Letter, May 20, 1939

Journalism

NEW FIELDS FOR THE WRITER—Stephen Moore, ed.—*National Library Press,* 127 p., $1.50. This book covers the fields of television, radio, film and drama.

Science News Letter, May 20, 1939

History

THE TRAGIC PENINSULA—Christ Anastasoff—*Published by Author,* 369 p., $3. A history of the Macedonian movement for independence—one of the indigenous movements complicating the struggle of rival groupings of powers for domination of the gateway to the east. Ever since 1878 tough-minded, intensely nationalist Macedonians, who are more Bulgar than anything else, have tried to be reunited to Bulgaria, but their territory remained a part of other countries as a result of Bulgaria's defeats in the Balkan wars and in the World War. An illustrated account of a movement and a people whose fate must be reckoned in the final settlement of the Balkan problem—if there ever is one.

Science News Letter, May 20, 1939

Chemistry

PHYSICAL CONSTANTS OF HYDROCARBONS. Vol. 1, Paraffins, Olefins, Acetylenes, and Other Aliphatic Hydrocarbons—Gustav Egloff—*Reinhold,* 403 p., $9. An important listing of constants for the hydrocarbons which will be of the greatest importance in its field of chemical research. The newest volume of the American Chemical Society's series of scientific and technologic monographs.

Science News Letter, May 20, 1939

Medicine

GETTING READY TO BE A FATHER—Hazel Corbin—*Macmillan,* 48 p., $1.25. More and more fathers are realizing these days that they have more than a financial responsibility in preparations for welcoming a new baby in the home. Those expectant fathers who cannot attend a class in paternity, such as is described in this book, will be able to get the information they need by reading the book. It is simple, specific, sound and helpful.

Science News Letter, May 20, 1939

Botany

THE WORLD OF PLANT LIFE—C. J. Hylander—*Macmillan,* 722 p., $7.50. Plant families are taken up in order, according to the Besseyan system, discussed interestingly in non-technical language, and illustrated fully with beautiful halftone plates and clean-cut line drawings. It is a big book—really a remarkable lot of botany for the price.

Science News Letter, May 20, 1939

Ornithology

A FIELD GUIDE TO THE BIRDS—Roger Tory Peterson—*Houghton Mifflin,* 180 p., plates, $2.75. A new edition, revised and enlarged, of one of the most successful fieldbooks of ornithology. An especially valuable feature are the pages of recognition silhouettes of birds, all drawn in the same attitude.

Science News Letter, May 20, 1939

General Science

CONSUMER SCIENCE—Alfred H. Nausrath, Jr. and John H. Harms—*Macmillan,* 692 p., $2.40. This "fusion course in physical science applied to consumer problems" is a general science text written with the idea that the student is primarily a user of science in his everyday life.

Science News Letter, May 20, 1939

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Additional Reviews On Page 319

Horticulture

YOUR GARDEN THIS WEEK — Ben Blackburn—*Rutgers Univ. Press,* 245 p., illus., $1. A garden calendar, telling the home flower and shrub gardener what to do from week to week from January to December.

Science News Letter, May 20, 1939

Zoology

WHAT SNAKE IS THAT?—Roger Conant and William Bridges—*Appleton-Century,* 163 p., illus., $2. A very convenient field handbook, with condensed descriptions in non-technical language and simple, clear recognition sketches.

Science News Letter, May 20, 1939

Anthropology

THE LAST OF THE SERIS—Dane Coolidge and Mary Roberts Coolidge—*Dutton,* 264 p., $2.50. See page 317.

Science News Letter, May 20, 1939

Conservation

PRINCIPLES OF GULLY EROSION IN THE PIEDMONT OF SOUTH CAROLINA—H. A. Ireland, C. F. S. Sharpe and D. H. Eargle—*Govt. Print. Off.,* 143 p., 65c.

Science News Letter, May 20, 1939

Chemistry

CRYSTALLINE ENZYMES, The Chemistry of Pepsin, Trypsin, and Bacteriophage—John H. Northrop—*Columbia Univ. Press,* 179 p., $3. One of the most interesting fields of progress in biological chemistry includes the organic catalysts that are called enzymes, best known of which is pepsin. The author of this authoritative monograph is a member of the Rockefeller Institute for Medical Research and has himself isolated and crystalized several of the enzymes.

Science News Letter, May 20, 1939

Health

IT'S MORE FUN TO BE THIN—Jean Z. Owen—*Marshall Jones,* 182 p., $2. Sound advice on losing excess weight, written with humorous understanding of the struggle.

Science News Letter, May 20, 1939

Psychology

SO YOU'RE GOING TO STOP SMOKING—J. C. Furnas—*Simon and Schuster,* 97 p., $1.25. See page 308.

Science News Letter, May 20, 1939

Psychology

THE LOGIC OF MODERN PSYCHOLOGY—Carroll C. Pratt—*Macmillan,* 185 p., $2. Acting on the belief that "the most important function of science is the construction of theory, for theories give meaning to facts and also make it possible to know what further facts are necessary, and where and how to look for them," the author presents his "Critical Positivism."

Science News Letter, May 20, 1939

Education

INFLUENCE OF NURSERY SCHOOL EXPERIENCE ON CHILDREN'S SOCIAL ADJUSTMENTS—Arthur T. Jersild and Mary D. Fite—*Teachers College, Columbia Univ.,* 112 p., $1.60. This study of 18 children indicates that attendance at nursery school makes little children more sociable with other youngsters without submerging the child's own individuality. The well adjusted pupil knows how to defend himself against aggressions from the others without himself becoming an aggressor.

Science News Letter, May 20, 1939

Sociology

SOCIAL WORK YEAR BOOK 1939—Russell H. Kurtz—*Russell Sage Foundation,* 730 p., $3.50. The three parts of this volume include: an authoritative record of organized activities, an analysis of state public assistance programs and a directory of 982 national and state agencies in social work and related fields.

Science News Letter, May 20, 1939

Archaeology

ARCHEOLOGICAL REMAINS IN THE WHITEWATER DISTRICT, EASTERN ARIZONA—Frank H. H. Roberts, Jr.—*Govt. Print. Off.* (Bureau of American Ethnology), 276 p., 50c. Excavations in this region have brought to light house remains showing an evolution from one-room pit dwellings to above-ground houses of several rooms, and also the associated underground ceremonial chamber. Tree-ring evidence makes dating possible in some buildings, and shows time involved in progress of ideas.

Science News Letter, May 20, 1939

General Science

ACTIVITIES IN GENERAL SCIENCE — Samuel P. Unzicker and Benjamin C. Gruenberg—*World Book Co.,* 202 p., 68c. A laboratory workbook for high school use.

Science News Letter, May 20, 1939

Education

EDUCATIONAL ACTIVITIES OF THE WORKS PROGRESS ADMINISTRATION—Doak S. Campbell, Frederick H. Bair, and Oswald L. Harvey—*Govt. Print. Off.,* 185 p., 25 c. A report of President Roosevelt's Advisory Committee on Education.

Science News Letter, May 20, 1939

Astronomy

VARIABLE STARS—Cecelia Payne-Gaposchkin and Sergei Gaposchkin—*Harvard College Observatory,* 382 p., $3.25. This book offers the reader the present observable knowledge of the variable stars. Written by two of Harvard's well-known astronomers, it seeks to weld the various parts of the study of variable stars into a coherent whole. While perhaps difficult reading for a layman the book is a mine of information for the expert.

Science News Letter, May 20, 1939

Chemistry

CHEMICAL INDUSTRIES—D. M. Newitt, ed.—*Chemical Publishing Co. of N. Y.,* 459 p., $4. A reference work of essential chemical facts and data. While in large measure made up of advertising of chemical manufacturing equipment it also contains much information for the technical needs of any chemical engineer.

Science News Letter, May 20, 1939

Sociology

KNOWLEDGE FOR WHAT?—Robert S. Lynd—*Princeton Univ. Press,* 268 p., $2.50. The author of Middletown looks at our social system through the eyes of a social scientist and discusses current problems of vital interest to us all. The concluding chapter on "Some Outrageous Hypotheses" is an eye-opener.

Science News Letter, May 20, 1939

Radio

PRINCIPLES AND PRACTICE OF RADIO SERVICING — H. J. Hicks — *McGraw-Hill,* 305 p., $3. Vocational school textbook for the radio repair man. A plain treatment of the theory of electricity and radio for the service man.

Science News Letter, May 20, 1939

Engineering

THE DEVELOPMENT OF POWER—Eugene C. Wittick — *Univ. of Chicago Press,* 164 p., $1. Man's devices to generate power from the earliest of windmills to the most modern of generators. Prolific illustrations and simple description show how they work and why. This book was written as one of the series used in Laboratory Schools of the University of Chicago.

Science News Letter, May 20, 1939

Anatomy

GROSS ANATOMY—A. Brazier Howell—*Appleton-Century,* 403 p., $6. A text for medical students which is "an exposition of the procedure followed in the course" on gross anatomy as given at the Johns Hopkins Medical School.

Science News Letter, May 20, 1939